

REMARKS

Applicant notes with appreciation that the previous drawing objection has been withdrawn. Applicant also notes with appreciation that the previous rejection under Section 102(b) based on the Perera patent (US 5,197,517) has been withdrawn. Applicant further notes with appreciation that dependent claim 5 has been recognized as reciting allowable subject matter. Applicant respectfully requests reconsideration of the subject application in view of the amendments and remarks set forth herein.

1. Attorney Docket Number

Applicant respectfully notes that a request to have the attorney docket number in this case updated to “097674.00011” was filed on February 5, 2007. However, the attorney docket number listed on the Office Action mailed on May 1, 2007 has not yet been updated. Applicant respectfully requests that the attorney docket number in this case be updated to “097674.00011.”

2. Claim Amendments

Independent claim 1 has been amended to correct for informalities raised by the Examiner in rejecting the claims under 35 U.S.C. 112, 2nd paragraph, which will be discussed in greater detail below, and to provide improved clarity. Dependent claim 7 has been amended to provide agreement with amendments made to claim 1. Applicant respectfully submits that no new matter is introduced by way of the foregoing claim amendments and prompt entry thereof is respectfully requested. .

3. Rejection Pursuant to 35 USC § 112, 2nd Paragraph

Claims 1-11 stand rejected under 35 U.S.C. § 112, 2nd paragraph, for purportedly failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In particular, the Office Action states that “the first inlet is improper (sic) cited for not referring to a second inlet.” (See paragraph 2 of the Office Action.)

Applicant respectfully traverses the Section 112 rejection. Claim 1 is amended to more clearly recite the presently claimed subject matter and to respond to the Examiner's concern that the "first" inlet is improperly cited. Recitations of "first inlet" in claims 1 and 7 have been amended to recite "inlet."

Accordingly, claims 1 and 7 have been amended to address the informalities raised by the Examiner. Applicant respectfully submits that at least for the foregoing reasons, the rejection under 35 U.S.C. § 112, second paragraph, should be withdrawn.

4. Rejection Under 35 USC § 102(b)

The outstanding Office Action sets forth a rejection under 35 USC § 102(b) as follows:

Claims 1-3, 6, 7, 9, 10 and 11 are rejected under 35 USC § 102(b) based on Davies (US 5,112,498). Applicant respectfully traverses the Section 102(b) rejection and reconsideration of the foregoing Section 102 rejection is respectfully requested.

According to the MPEP, "[t]o anticipate a claim, the reference must teach every element of the claim." (See, e.g., MPEP § 2130.) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631 (Fed. Cir. 1987). (See, e.g., MPEP §2130.)

Applicant respectfully submits that the Davies '498 patent fails to anticipate the rejected claims because, at a minimum, the Davies '498 patent does not describe "each and every element" thereof. Indeed, the Davies '498 does not teach or suggest "at least one secondary upper layer that substantially follows a second flow path radially inwardly towards said central axis, wherein said primary lower layer and said secondary upper layer interact and support each other in a non-destructive manner from peripheral side wall to said outlet," as recited in independent claim 1.

The Davies '498 patent is directed to a "coalescing device," not an "apparatus for regulating the spray through a nozzle" as claimed by applicant. A coalescing device, by its very nature, would be located upstream of some other separation equipment (as discussed in the background of the Davies '498 patent), and is wholly unrelated to spray regulation of nozzles. Thus, the Davies device has an entirely different purpose relative to the presently disclosed and claimed invention, and could not be used to achieve regulation of flow through a spray nozzle.

Applicant respectfully submits that, in applying the Davies '498 patent under Section 102(b), the Examiner has not appreciated key distinctions relative to the structures disclosed by Davies. In particular, independent claim 1 expressly recites, *inter alia*, "at least one secondary upper layer that substantially follows a second flow path radially inwardly towards said central axis, wherein said primary lower layer and said secondary upper layer interact and support each other in a non-destructive manner from peripheral side wall to said outlet." That is, claim 1 recites a primary lower layer and a secondary upper layer that "interact and support each other in a non-destructive manner from peripheral side wall to said outlet."

In distinct contrast, the device disclosed by Davies has a primary inlet 12 (for introduction of "oily water") and a secondary inlet 14 (for introduction of water) formed in a chamber 10. The secondary inlet 14 is used to regulate pressure drop between the primary inlet 12 and outlet 16. As shown in FIG. 1, the axes of the primary inlet 12 and the secondary inlet 14 are formed in the same plane of the chamber 10. When fluid enters the chamber 10 through the secondary inlet 14, this fluid interacts with the fluid entering the chamber 10 from the primary inlet 12 to deflect the flow entering via primary inlet 12 into a rotating motion. However, there is only one resultant layer within the chamber 10 due to the co-planar placement of the primary inlet 12 and the secondary inlet 14 in chamber 10 of the Davies '498 patent. (See, e.g., col. 2,

lines 28-32 of Davies.) Moreover, fluids entering chamber 10 through the primary inlet 12 and the secondary inlet 14 necessarily (and by design) interact with one another in a destructive manner. (See, e.g., col. 2, lines 45-50 of Davies.) Indeed, the very purpose of the Davies design is the opposite of establishing distinct non-destructive layers (as claimed by applicant). Rather, the Davies design causes the higher density oil in the “oily water” to be centrifugally forced outwardly via deflection of flow through inlet 12 by the secondary flow 14, thereby allowing the oil to coalesce such that, at a downstream location of outlet 16, it is easier to separate the oil from the water.

Thus, the Davies ‘498 patent fails to teach or suggest “at least one secondary upper layer that substantially follows a second flow path radially inwardly towards said central axis, wherein said primary lower layer and said secondary upper layer interact and support each other in a non-destructive manner from peripheral side wall to said outlet,” as recited by independent claim 1. For at least the foregoing reasons, Applicant respectfully submits that independent claim 1 patentably distinguishes over the Davies ‘498 patent.

Claims 2-3, 6, 7 and 9-11 are dependent, either directly or indirectly, upon claim 1 and thus are allowable for at least the reasons noted herein with respect to independent claim 1. Reconsideration and withdrawal of the outstanding Section 102(b) rejection based on the Davies ‘498 patent are respectfully requested.

5. Rejection Pursuant to 35 USC § 103(a)

The outstanding Office Action also sets forth rejections under 35 USC § 103(a) as follows:

Claims 1-4, 6, 9 and 11 are rejected under 35 USC § 103(a) based on the teachings of Perera (US 5,197,517) in view of Hall (US 1,874,970); claim 8 is rejected under 35 USC § 103(a) as being unpatentable over the Davies ‘498 patent in view of Jacob (US 5,054,474) or

Perera in view of Hall and further in view of Jacob; and claim 10 is rejected under 35 USC § 103(a) as being unpatentable over Perera in view of Hall and further in view of Hunter (US 3,070,317). Applicant respectfully traverses the Section 103(a) rejections. Reconsideration of the foregoing Section 103 rejections is respectfully requested.

Regarding claims 1-4, 6, 9 and 11, the Examiner asserts that Perera teaches all the limitations except for the claimed “at least one secondary upper layer,” which the Examiner asserts is disclosed by Hall. Applicant respectfully disagrees.

The Perera ‘517 patent discloses a device that includes a first substrate 1 having a central aperture 3 through which a fluid passes into the device; a second substrate 5 having a circular recess 7, wherein a control groove 11 extends tangentially from the recess 7 to a control inlet 13; and a third substrate 15 having an annular groove 17, wherein an outlet duct 19 extends radially from the annular groove 17. That is, the outlet duct 19 extends through a peripheral wall of the annular groove 17. The outlet duct 19 does not extend through an end wall of either the circular recess 7 or the annular groove 17. Accordingly, the Perera ‘517 patent fails to teach or suggest “an outlet exiting through one of said end walls,” as recited by independent claim 1. Further, Perera fails to teach or suggest a structural design such that, in use, “a flow of fluid entering through said inlet has a primary lower layer that substantially follows a first circular flow path which forms a vortex commencing at or near said peripheral side wall and increases in velocity and pressure towards said outlet,” as recited by independent claim 1.

Moreover, contrary to the position advanced in the Office Action, Hall fails to teach or suggest “at least one secondary upper layer that substantially follows a second flow path radially inwardly towards said central axis, wherein said primary lower layer and said secondary upper layer interact and support each other in a non-destructive manner from peripheral side wall to

“said outlet.” Rather, Hall discloses a spud for a gas burner that includes a tubular body 6, an inlet throat 10 having two outlet orifices 13 which direct gas towards the walls of a chamber 14. At the base of the body 6, air openings 17 are provided. Gas exiting the outlet orifices 13 flows upwardly in a spiral course forming a gaseous envelope. Air entering through the air openings 17 will “ascend inside the gaseous envelope.” (See lines 84-87 of Hall, emphasis added.) As shown in Hall’s FIG. 1, gas flow is indicated by arrows “b” and air flow is indicated by arrows “a”. Applicant notes that reference items “a” and “b” refer to arrows that illustrate a direction of flow; they do not refer to layers. Further, the gas and air inside the spud form a mixture from the instant that air enters the spud through the air openings 17. That is, the gas and air do not form discrete layers, instead, they form a single mixed layer. Accordingly, Hall fails to teach or suggest “at least one secondary upper layer that substantially follows a second flow path radially inwardly towards said central axis, wherein said primary lower layer and said secondary upper layer interact and support each other in a non-destructive manner from peripheral side wall to said outlet,” as recited by independent claim 1.

Finally, there is no motivation to combine the teachings of the prior art references as proposed by the Examiner. The Examiner apparently finds motivation in the Hall reference to combine the teachings of Perera with Hall to “provide an effective way for mixing.” However, claim 1 is directed to an “apparatus for regulating fluid flow through a spray nozzle” and is silent regarding mixing. Perera is also silent with regard to mixing. Further, Perera is directed to a valve in which two fluid flows are arranged to form a vortex and Hall is directed to gas burner spud in which air is mixed with a flammable gas. Moreover, there is no teaching or suggestion that Hall’s device would work with fluids. Accordingly, contrary to the position advanced in the Office Action, there is no motivation to combine these reference as suggested by the Examiner.

Beyond the lack of motivation to combine, even assuming, *arguendo*, such motivation existed, the combination would not result in the apparatus recited in independent claim 1 for the reasons noted above.

For at least the foregoing reasons, Applicant respectfully submits that independent claim 1 patentably distinguishes over the Perera patent in combination with the Hall patent. The secondary references cited with respect to dependent claims 8 and 10 fail to cure the substantial deficiencies noted with respect to independent claim 1. Thus, applicant respectfully requests reconsideration and withdrawal of the outstanding obviousness rejections directed to dependent claims 2-4 and 6-11, each of which depends directly or indirectly from independent claim 1.

6. Response to Advisory Action

In the Advisory Action, the Examiner raises an issue with respect to support for independent claim 1, stating:

The instant claim 1 contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, with one inlet at or near the peripheral side wall, how can one introducing a primary lower layer flow of fluid at the same inlet introducing at least one secondary upper layer.. [Advisory Action, Continuation of 13.]

Applicant respectfully submits that -- contrary to the position advanced in the Advisory Action -- the specification fully supports and enables the presently claimed apparatus for regulating fluid flow through a spray nozzle, as recited in independent claim 1 and dependent claims 2-11 (which depend directly or indirectly therefrom). More particularly, with reference to the specification commencing at page 6, line 22, and the accompanying figures (specifically Figs. 4-12C), applicant discloses an apparatus that includes, *inter alia*:

an inlet at or near said peripheral side wall to allow a flow of fluid to enter said chamber substantially tangential to said peripheral side wall...wherein in use a flow of fluid entering through said inlet has a primary lower layer that substantially follows a first circular flow path

which forms a vortex commencing at or near said peripheral side wall and increases in velocity and pressure towards said outlet; and at least one secondary upper layer that substantially follows a second flow path radially inwardly towards said central axis, wherein said primary lower layer and said secondary upper layer interact and support each other in a non-destructive manner from peripheral side wall to said outlet.

For example, as described with reference to Figs. 5-8, an apparatus for regulating fluid flow through a spray nozzle as recited in independent claim 1 is fully supported:

Both embodiments of FIGS. 5 and 6 comprise an internal disc 9, shown in FIG. 8 that is preferably used to form the aforementioned chambers 1a and 1b respectively. In each embodiment, disc 9 also distributes the flows into the chambers 1a or 1b. With these embodiments both flows enter the chamber through the face 10 of the disc 9. In use, the water flow enters tangentially through eight inlet ports 11 around peripheral side wall 12 of disc 9. A substantial portion of the flow develops into a primary lower layer, similar to 16, shown in FIG. 4. However, a portion of the flow as it passes through the eight apertures 20 associated with inlet ports 11 is urged circumferentially into the annular gap 13 between disc 9 and shower housing 15a or 15b. An enlarged view of gap 13, which is located radially outwardly relative to the peripheral side wall 12, is shown in FIG. 7. This flow then becomes a secondary upper layer, similar to 17, shown in FIG. 4, and proceeds radially inwardly towards outlet 4a or 4b. The spray characteristics of each shower head is determined by the fixed width of gap 13, as it sets the magnitude of the secondary upper (control) layer relative to the primary layer. [Page 7, line 30 to page 8, line 10; emphasis added.]

Additional embodiments supporting and enabling the claimed “apparatus for regulating fluid flow through a spray nozzle” of independent claim 1 are set forth in the specification, as filed (see, e.g., Figs. 9-11 and the accompanying narrative description). For at least the foregoing reasons, applicant respectfully requests that the Examiner reconsider and withdraw the position advanced in the Advisory Action with respect to support/enablement.

7. Resubmission of IDS

Applicant notes the Examiner's request that a supplemental signed IDS be submitted with respect to the submission initially made on September 30, 2005. Applicant submits herewith such supplemental IDS and requests prompt consideration and entry thereof.

8. Conclusion

In view of the above mentioned amendments and remarks, it is respectfully submitted that the claim rejections under Section 112, 2nd paragraph, 102(b) and 103(a) should be reconsidered and withdrawn. Applicant respectfully submits that all claims are in condition for allowance. Early and favorable action is earnestly solicited. If the Examiner believes that a telephone conversation may be useful in advancing prosecution of this application, he is invited to contact applicant's attorney at the number set forth below.

Respectfully submitted,



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